Federal Air Surgeon's
Medical Bulletin

Published by
FAA Civil Aeromedical Institute
Aeromedical Education Division
P.O.B. 25082
Oklahoma City, OK 73125-5064

Aviation Safety Through Aviation Medicine
For FAA Aviation Medical Examiners, Office of Aviation Medicine Personnel, Flight Standards Inspectors, and Other Aviation Professionals.

99-3
Fall 1999

U.S. Department of Transportation
Federal Aviation Administration

New Internet-Based Airman Medical Certification System Operational

THE LONG-ANTICIPATED inauguration of the Internet-based airman medical certification system transpired on September 20, well ahead of the October 1 date that all aviation medical examiners are required to be online. On September 20, certification history was made when US aviation medical examiners could use their computers and the Internet to transmit medical examination data to the Aeromedical Certification Division in Oklahoma City, Okla.

The new system is designed to improve and simplify the processing of airman certification data while reducing clerical errors and delays.

Information Packets Mailed

To assist in the mechanics of the transition, an instruction manual, user names, and passwords were sent to all US aviation medical examiners. The manual contains information about how to use the Internet-based system, equipment recommendations, frequently asked questions, and what to do in the event of problems.

The user name you received works in conjunction with your password, which, for security reasons, was sent to you in a separate mailing. *You must use both the user name and user password together, or you will be unable to log on to the system*. If you have not received any of these materials, contact:

FAA Civil Aeromedical Institute
Aeromedical Certification Division
AAM-300
P.O. Box 26080
Oklahoma City, OK 73126

Help Line

For technical support with the Airman Medical Certification System, call the AMCS Hotline:
(405) 954-3238

New 8500-8 Reminder

By now, you should have received a supply of the revised FAA Form 8500-8 (3-99). The new form is labeled *Series FF* and replaces all previous versions. Destroy all old series EE forms that are dated 7-92 and use the Series FF forms.

The updated form reflects changes to Title 14 of the Code of Federal Regulations, parts 67 and 61; also the new form ensures compatibility with the Internet-based Airman Medical Certification System.

If you have not yet received your forms, please contact:

FAA Civil Aeromedical Institute
Aeromedical Education Division
Shipping Clerk
AAM-400
P.O. Box 25082
Oklahoma City, OK 73125

New *Guide* Mailed

Finally, another item recently mailed to all aviation medical examiners is the revised *Guide for Aviation Medical Examiners*. The revised *Guide* (dated October 1999) reflects the changes to the new Form 8500-8 and should be on your desk by now. (For more information on recent mailings, see the summary on page 16.)

Raynaud's Phenomenon And Flying

Capt. Donato J. Borrillo, MD, JD

QUESTION NUMBER 18 ON Federal Aviation Administration Form 8500-8 asks, "Have you ever had or have you now any of the following… (g)… Heart or vascular trouble?" As we approach the winter season, the applicant airman may ask the aviation medical examiner (AME) about Raynaud's phenomenon.

First described in 1862 by French physician Maurice Raynaud, "cold hands syndrome" is usually more of a nuisance than a danger to pilots, although some cases can be extremely painful and debilitating. The disease appears to be about five times more common in women (ages 15 to 40) than in men, afflicting 5 to 10 percent of the general population. Symptoms may appear to be more common in people who live in colder climates; however, people with the disorder

Continued on page 3

HEADS UP

The Federal Air Surgeon's Column

Customer Feedback: There Is No Other Way

Jon L. Jordan, MD, JD

WHETHER IN PRIVATE INDUSTRY or government, success for any organization and the people working in the organization depends upon keeping in touch with their customers. For businesses, neglecting to interact with customers frequently results in providing a service or product for which there is no demand. This means failure for the business.

While obviously not exactly the same, there are parallels for government. For example, failure to interact with customers can result in reduced governmental effectiveness through a lack of understanding of the customers' needs. Without seeing matters from the customers' perspectives, government can inflict undue discomfort and economic hardship. The end result may well be customer rebellion and noncompliance. For an agency such as the Federal Aviation Administration (FAA), this has great importance, since matters of aviation safety are at stake.

> "Neglecting customer interaction frequently results in providing a service or product for which there is no demand…"

The FAA, including the Office of Aviation Medicine, has a clear policy of pursuing good customer service and, to promote this, interacting with our customers at all levels. For this reason, I encourage employees throughout the organization to establish and maintain as much personal contact with our airman customers as possible. Our professional and educational support staffs from the Washington headquarters office, Civil Aeromedical Institute, and the regional medical divisions are heavily involved in customer outreach and education programs.

Those of you who attended the Experimental Aircraft Association's (EAA's) fly-in and airshow at Oshkosh this year would have noticed the strong presence of the Office of Aviation Medicine. I was there, along with staff members from the Washington office, the Civil Aeromedical Institute, and the Great Lakes Region office. We participated in medical forums sponsored by both the FAA and EAA, maintained an information booth for purposes of disseminating aeromedical information and personalized advice to airmen, and operated two spatial disorientation simulators to provide physiological training for airmen.

This contact with airmen at the "grass roots" level gives us the opportunity not only to individually assist airmen who are having problems working their way through the complexities of our certification system, but also to get feedback on what is — and what is not working for them. Through our participation in the open forums, airmen can ask hard questions about the "whys" and "wherefores" of certification policies and even air their own personal experiences with the certification program.

In dealing with these questions, I find that, while airmen are not always pleased with our answers, they appreciate the opportunity to be heard and to be responded to with candor. Not only have we been able to soften for the airmen our "image" of being cold and unfeeling, we have often gone away from these meetings with new thoughts and ideas about how we can improve the certification system — not only for the airmen but for ourselves as well.

Sometimes it's difficult for managers, whether in business or in the government, to interact with customers – we don't always hear what we'd like to hear, either about ourselves or our organizations. I'm convinced, however, that to be fully successful, there is no other way.

JLJ

Federal Air Surgeon's Medical Bulletin

Secretary of Transportation
Rodney E. Slater

FAA Administrator
Jane F. Garvey

Federal Air Surgeon
Jon L. Jordan, MD, JD

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Michael E. Wayda

The Federal Air Surgeon's Medical Bulletin *is published quarterly for Aviation Medical Examiners and others interested in aviation safety and aviation medicine. The* Bulletin *is prepared by the FAA's Civil Aeromedical Institute, with policy guidance and support from the Office of Aviation Medicine. An Internet on-line version of the* Bulletin *is available at: http://www.cami.jccbi.gov*

Authors may submit articles and photos for publication in the Bulletin *directly to:*

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Raynaud's *from page 1*

who live in milder climates may have more attacks during periods of colder weather. Attacks can also be triggered by emotional stress.

Raynaud's phenomenon usually attacks the fingers or toes, but it may affect the nose, lips, or ear lobes. Fingers turn pale and cyanotic, with rubor returning within five minutes to an hour after the initiation of an attack. The pallor and cyanotic phases are accompanied by numbness, whereas, rubor is accompanied by a burning sensation. As the attack ends, throbbing and tingling may occur in the fingers and toes.

Normal vasoconstriction, in response to a cold environment, preserves the body's core temperature by shunting blood from arteries near the skin's surface to veins deeper in the body. In patients with Raynaud's phenomenon, this normal bodily response is intensified by the sudden spasmodic contractions of arterioles. Vasospastic attacks cause blood vessels to constrict and may cause the arteries of the fingers and toes to collapse. Blood supply to the extremities is greatly decreased, thereby causing the described skin discoloration and pain sensations.

The AME must distinguish between primary Raynauds's phenomenon and secondary Raynaud's phenomenon. Primary Raynaud's phenomenon is also called Raynaud's disease, idiopathic Raynaud's phenomenon, or primary Raynaud's syndrome.

In primary Raynaud's phenomenon, which is the most common and milder form, no underlying disease or associated medical problems exist. The airman does not require denial, or deferral, of her or his medical certificate. The AME should emphasize the need for protection from the cold during all phases of pre-flight, flight, and post-flight. The whole body should be kept warm, since keeping the trunk warm frees up blood that can then be used to heat the extremities. The pilot should be encouraged to dress in layers and wear a warm hat. Cloth protectors on headset muffs may also prevent ear-related attacks. Although mittens are encouraged in the general population, gloves with liners provide pilots with better feel and dexterity. Ideally, the cockpit should be warm and the pilot symptom free prior to run-up.

If symptoms occur in flight, holding the hands over the head to drain venous blood, and then whirling them around to speed the circulation of arterial blood can warm the hands. Of course, care should be taken when performing this maneuver in a small cockpit. Chemical warmers, such as small heating pouches that can be placed in pockets, boots, or shoes, can give added protection during long flights. Any tobacco use by the pilot should be discouraged, since nicotine is a vasoconstrictor. Exercise should be encouraged.

Approximately 10 percent of cases are attributable to secondary Raynaud's phenomenon, a more complex and serious disorder. Connective tissue diseases are the most common cause of secondary Raynaud's phenomenon and are seen with 85 to 95 percent of patients with scleroderma and mixed connective tissue diseases.

Additionally, about one-third of patients with systemic lupus erythematosus have secondary Raynaud's. Less commonly, patients also have other connective tissue diseases, including Sjögren's syndrome, dermatomyositis, and polymyositis. Possible causes of secondary Raynaud's phenomenon, other than connective tissue diseases, are carpal tunnel syndrome and obstructive arterial disease. Some drugs, including beta-blockers, ergotamine preparations, certain agents used in cancer chemotherapy, and drugs that cause vasoconstriction such as some over-the-counter cold medications and narcotics, are linked to Raynaud's phenomenon.

Finally, secondary Raynaud's phenomenon is also associated with diseases of the arteries, such as Buerger's disease and atherosclerosis. The AME should pursue any findings on history or physical that fall into the above disease patterns and defer complex cases to the FAA.

A letter of denial for the symptom of Raynaud's, by itself, is rarely if ever warranted. Common ancillary studies associated with the work-up of secondary Raynaud's phenomenon include nailfold capillaroscopy, antinuclear antibody test, and an erythrocyte sedimentation rate. The AME should strongly consider submitting these studies when disposition is deferred to the FAA.

The AME should also be vigilant for airmen using calcium-channel blockers, alpha-blockers, or a nonspecific vasodilator, such as nitroglycerine paste applied to the fingers.

Of recent aeromedical interest, astronaut Dr. **Mae Jemison** used biofeedback on the science mission shuttle *Endeavor*. She used her thoughts to control motion sickness instead of taking medicine. This is promising for sufferers of Raynaud's, since stress is a common precipitating factor, and many patients benefit from stress reduction strategies and relaxation techniques. Biofeedback and autogenic training, developed by **J. H. Schultz** in Germany, is a form of thermal physiologically directed self-hypnosis.

In summary, the AME must determine whether the airman applicant has primary or secondary Raynaud's phenomenon. The airman with primary Raynaud's requires preventive health care information for safe flight, whereas the airman with secondary Raynaud's may require deferral and further evaluation.

Dr. Borrillo is the Chief of Flight Medicine, 352nd Operations Support Squadron, USAF Special Operations Command, Royal Air Force Base, Mildenhall, England. He is Board certified in Aerospace Medicine. In addition, he is a commercial pilot, an AME, and a practicing attorney.

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Night Vision Goggles In Civilian Helicopter Operations

Guillermo J. Salazar, MD
Van B. Nakagawara, OD

DEVICES USED TO ENHANCE night vision involve a variety of technologies such as forward-looking infra red (FLIR) and night vision goggles. Because of the recent approval for use in civilian aviation, the focus of this article is on night vision goggles, commonly known as NVGs.

For many years, these devices have been indispensable in military and law enforcement nighttime operations. However, with the rapid increase in civilian helicopter operations in support of such round-the-clock activities as emergency medical services (EMS), oil exploration, and news coverage, to mention a few, the logical progression was the application of NVG use by civilian flight crews.

On January 29, 1999, the Federal Aviation Administration issued the first supplemental type certificate (STC) to permit use of NVGs by a civilian helicopter EMS operator. With this in mind, and fully expecting that additional STC requests will follow, it will only be a matter of time before aviation medical examiners (AMEs) are faced with an NVG user as an FAA medical certificate applicant. Therefore, to ensure aviation safety, it is important for AMEs to be aware of this technology and to understand some of the basic operational issues and the associated clinical implications of its use.

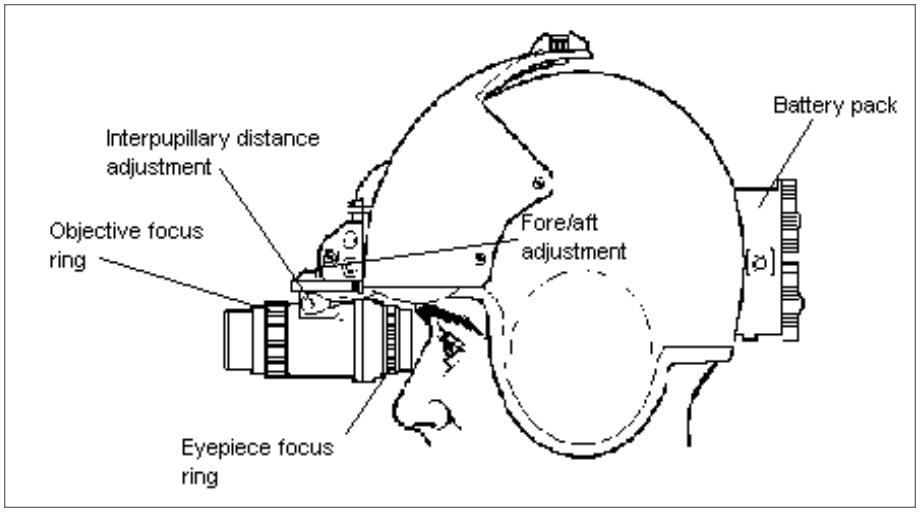

Figure 1. Parts of a typical NVG unit (modified from USAF).

Vision

The human eye is a complex organ that works best in an environment were there is an adequate amount of light. At night we can still see; however, color vision, depth perception, and visual acuity are adversely affected. Acuity can be degraded to 20/200 or worse at night. As light levels drop, the sensitivity of the retina (the innermost nervous membrane of the eye where images are focused) is affected, with central vision being impacted the most in low-light conditions. The retina is composed of two principal cell types, rods (used for low-light vision) and cones (utilized mainly for bright-light vision). Rods are the primary source of vision when light levels drop below 0.1 footcandles, e.g., full moonlight. It can take up to 30 or 40 minutes to become fully dark-adapted when the eye is exposed to low light or darkness.

The physiological limitations of human vision present a significant challenge to aviators flying at night. This is where night vision devices become invaluable. By amplifying low levels of ambient light, these devices decrease some of the limitations associated with unaided vision in the dark. By no means do they turn night into day or compensate for all problems, but they are a considerable improvement over the unaided eye.

NVG technology

The simplest analogy to explain how NVGs work is a video camera. The basic principle is the same, in that you are not directly seeing what you look at, but rather you are viewing an electronic image of a scene. NVG equipment may be monocular or binocular; however, in aviation, binocular, helmet-mounted equipment is almost exclusively used. Like a video camera, electromagnetic energy, i.e., light, enters the optical elements of the system and is directed to an electronic processing unit. In the case of an NVG, this unit is called an image intensifier, or photocathode.

Unlike the video camera, the NVG does not require much light to produce an image. Light as faint as a starlight or low-level moonlight may suffice. However, the effectiveness of the equipment is diminished in total darkness. The image intensifier will,

Guillermo J. Salazar, MD, is the Regional Flight Surgeon for the Federal Aviation Administration's Southwest Region. Van B. Nakagawara, OD, is the Team Coordinator of the Civil Aeromedical Institute's Vision Research Team.

(Continued)

NVGs *from page 4*

as its name implies, intensify what little light there is, on average some 1,000 to 3,000 times. More sophisticated equipment is capable of even greater intensification, some on the order of 35,000 times. That amplified or intensified electromagnetic energy is projected onto a phosphor screen that in turn creates a monochrome, video-like image, which the user sees through the eyepieces.

Aviation models are helmet-mounted with electrical power supplied by a battery pack on the back of the helmet (see Figure 1). As with any optical device, the user has a variety of ways of adjusting the fit and focus. NVG binoculars and mounting assembly are cumbersome, weighing close to one pound—not counting the weight of the helmet and battery pack.

Disadvantages

- Current NVGs provide only 40-60 degrees of the total field of vision. In the past, the major problem with NVGs was that one sacrificed resolution when maximizing the field of vision. With a reduced field of vision, effective scanning techniques are imperative, especially in single-pilot aircraft operations[1]. In addition to reducing field of view, NVGs reduce depth perception. This limits the ability of the pilot to determine closure on terrain or other aircraft when first detected.
- Visual acuity from NVG devices provides a vast improvement over human night vision, which can be 20/200 or lower. At 1/10 of normal starlight, one can see as well with an NVG as 20/40 visual acuity in daylight. However, 20/40 vision will not let you see wires on poles unless they are shiny, large, or very close.
- Inhibited visual acuity would also reduce the ability to perceive objects and terrain features. NVG vision is enhanced proportionally to altitude and airspeed. With NVGs, "lower and slower" improves visual acuity; at 300 feet above ground level and above, your visual acuity diminishes.
- NVGs do not provide full color vision, only a green monochrome image. The night vision phosphor is green. This allows the user to see more detail, but with no color differential.
- It is important to note that NVG-aided acuity of 20/30 or 20/40 assumes perfect cockpit lighting, properly focused goggles, and ideal weather conditions. Changing illumination can affect visual acuity. Internal or external incompatible light could result in "washout" or halo effects when using NVGs. Looking at the moon with an NVG is comparable to looking directly at the midday sun with the naked eye. This could result in glare, flashblindness, and afterimage.
- Particularly troublesome is ensuring that aircraft and cockpit lights are NVG-compatible. Incompatible lights make the outside scene less visible with NVGs. Changing cockpit lights to be NVG-compatible is very complicated and expensive.
- NVGs are sensitive to light ranging from yellow-green to near-infrared. The Federal Aviation Administration requires operators to use aircraft position and anti-collision lights. Such flickering or flashing lights can cause operational problems for NVG wearers.
- Low-light levels inherently produce decreased visual resolution, acuity, and contrast, making hazard detection more difficult. Even with NVGs, all of these limitations will still be present.
- NVGs are subject to interference by such factors as rain, clouds, mist, dust, smoke, and fog. Any of these factors will tend to severely degrade the performance of the equipment. Landing in dusty areas can cause "brown outs" with the goggles and particularly hazardous are obstacles or terrain features that may be masked in shadows.
- Experience and recurrent training are crucial to using NVGs safely.

Summary

Because helmet-mounted NVGs are heavy, pilots with cervical problems must be carefully examined to ensure they have the physical ability to use the equipment. With prolonged use, NVGs may cause neck discomfort or general fatigue.

Also, AMEs need to carefully assess vision and the compatibility of current ophthalmic corrective devices for use with night vision goggles.

Finally, to ensure aviation safety, aviation medical examiners should be prepared to discuss visual physiology and night vision limitations with pilots.

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Letter to the Editor

Dear Editor:

Regarding LASIK treatments, here are two references in the public domain:

➢ *The Eye Laser Miracle: The Complete Guide to Better Vision*, by Andrew I. Caster, MD. This is a 1998 paperback (1997 hardcover) by an author who is favorable regarding LASIK treatment. However, he is honest about potential post-treatment residual glare problems.

➢ *Zap Your Myopic Eyes?* An article in *Consumer Reports*, June 1999, pages 56-7. This recent article, more up to date, explains the procedure and also is very clear on the post-treatment glare problems. In this article are six Internet sites that might be worth visiting directly.

Ed Gordy, MD
Newtonville, Mass.

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[1] *Scientists at Wright-Patterson Air Force Base's Armstrong Laboratory have developed a Panoramic Night Vision Goggle. It has a 30⁰ binocular field and monocular extensions (100⁰ X 40⁰), providing a relatively wide field of vision. However, the device will not be operational for 2-3 years.*

Managing the Special Issuance System

Warren S. Silberman, DO, MPH

For some aviation medical examiners, the Special Issuance procedure is shrouded in mystery and uncertainty, and is sometimes not clearly understood. Because the Special Issuance is often a pilot's best recourse to quickly return to flying after a disqualifying physical impairment, it is important that AMEs grasp the basic principles of Special Issuances. —Editor

PART 67.401 of the Code of Federal Regulations[1] states that the Federal Air Surgeon can authorize a Special Issuance of a medical certificate that is valid for a specified period to airmen who do not meet our medical standards.

To obtain the Special Issuance, the airman must demonstrate to the satisfaction of the Federal Air Surgeon that the duties authorized can be performed without endangering public safety during the period the authorization would be in force. A medical certificate issued in accordance with this section expires at the end of the validity period or upon withdrawal of the authorization.

At the end of this validity period, the airman must again demonstrate to the Federal Air Surgeon that flying duties can be safely performed for another specified time period by providing corroborating test data or a statement from the treating physician.

Please refer to the example of a Special Issuance letter and the numbers next to the relevant sections (see adjacent page).

❶ This is the diagnosis that disqualified the airman from flying.

❷ This refers to the sections of Part 67 under which the airman is not qualified to pilot an aircraft. In this case, it is the medical history of myocardial infarction and coronary artery disease that requires treatment. We list the standards for all classes of medical certificates (even though the airman only desires a third-class medical certificate) because these conditions are disqualifying for all three classes.

Text continued on page 7

U.S. Department of Transportation
Federal Aviation Administration

Mike Monroney Aeronautical Center
Civil Aeromedical Institute (CAMI)

P.O. Box 26080
Oklahoma City, OK 73126

AUTHORIZATION FOR SPECIAL ISSUANCE OF A MEDICAL CERTIFICATE (AUTHORIZATION)

AAM-320

Dear Mr. (NAME):

Reference: PI#_____

I have reviewed the information submitted by you in support of your request for an airman medical certificate. The medical evidence reveals a history of

❶ **myocardial infarction and coronary artery disease that required bypass surgery**.

❷ You are ineligible for third-class medical certification under Section 67.111(a) (2) (3), 67.211(a) (c), and 67.311(a) (c) of Federal Aviation Regulations (FARs). However, based on the complete review of the available medical evidence, I have determined that you may be granted **authorization for special issuance of the enclosed third-class airman medical certificate under Section 67.401 of the FARs. This certificate is not valid after June 30, 2000 and supersedes any previously issued medical certificate.**

❸ **This authorization expires on June 30, 2000.**

Consideration for a new Authorization will be contingent upon the following, (**performed in accordance with the enclosed specifications**):

❹

1. On or about April 1, 2000, and at subsequent **12-month intervals**, a current cardiovascular evaluation and current lab report.
2. On or about April 1, 2000, and at subsequent **12-month intervals**, a current exercise stress test.
3. On or about April 1, 2001, and at subsequent **24-month intervals**, a report of current stress SPECT radionuclide scintography.

If there have been no significant adverse changes in your medical status, you have complied with all conditions of certification described in your Authorization, and we are satisfied that the duties permitted by the medical certificate can be performed without endangering public safety, the Medical Appeals Branch may then grant you a new Authorization for an additional period. You will still be required to have your regular third-class physical examinations at the frequency prescribed under the provisions of 14 CFR 61.23.

In order to avoid a lapse in certification, the necessary testing should be completed near the date noted above and forwarded in one package to the following office:

Medical Appeals Branch, AAM-320
Aeromedical Certification Division
Federal Aviation Administration
Post Office Box 26082
Oklahoma City, OK 73126

OR

Medical Appeals Branch, AAM-320
Aeromedical Certification Division
Federal Aviation Administration
6700 S. MacArthur Blvd., Room B-13
Oklahoma City, OK 73169

You must promptly report any adverse changes in your medical condition or medications to the Federal Aviation Administration Medical Appeals Branch, AAM-320.

Use of the above reference number and your full name on any reports or correspondence will aid us in locating your file and expediting a reply to you.

Sincerely,

Warren S. Silberman, D.O., M.P.H.
Manager, Aeromedical Certification Division
Civil Aeromedical Institute

[1] *Please refer to Appendix A of the* Guide for Aviation Medical Examiners *(October 1999).*

Special Issuance *from page 6*

❸ This is the date that the authorization letter expires. The validity period is described in Part 67.401. This should also correspond with the date that the medical certificate expires. For third-class airmen with a disqualifying cardiac condition, this period is usually 12 months from the time that the airman had his cardiovascular evaluation and treadmill stress test. We are attempting to make this date correspond with the halfway point in the duration of the medical certificate or the time that the next examination comes due. For first- and second-class cardiac cases, the validity periods are six and 12 months.

❹ This is the listing of the specific periods during which we need to have medical statements from the treating physician and specific test data. In the case example shown, this period is three months from the expiration date of the Authorization. We allow airmen to send in their required material early so that we can review it and return the new Authorization letter in time to avoid unnecessary periods of grounding. For third-class airmen, this period is three months; in first- and second-class airmen, it is two months. Note that the mention of examinations or testing required in #4 is brief. We did this to make the letter shorter and less complex appearing.

❺ Refers to the "Specification Sheet," which is an enclosure in the envelope with the Authorization letter. This sheet describes exactly what we want the airman to provide us with and how the particular testing is to be performed for aeromedical purposes. We strive to ask only for those tests that we believe are necessary to make an appropriate certification decision. The specific tests that we ask for have been discussed at great length with the consultants who provide advice to the Federal Air Surgeon on complex cases. We want you to tell airmen that they should treat this page as a "checklist." Please send us all the material at one time, along with the airman's identifying number (PI number).

I hope this explanation has made Special Issuance letters less confusing for you and your airman. If either of you see a possible error in the dates, please check with us or ask your regional flight surgeon.

Dr. Silberman manages CAMI's Aeromedical Certification Division.

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❺ **SPECIFICATIONS**

1. A current cardiovascular evaluation to include an assessment of personal and family medical history, a clinical cardiac and general physical examination. A typed statement regarding the applicant's symptoms, treatment, medications, functional capacity, modifiable cardiovascular risk factors, motivation for any necessary change and prognosis for incapacitation during the certification period.

   A current report of fasting blood sugar and a blood lipid profile to include total cholesterol, HDL, LDL and triglycerides.
2. A current maximal treadmill stress test. All stress testing should achieve 100 percent of predicted maximal heart rate unless medically contraindicated or prevented either by symptoms or concurrent medication, such as **beta blockers, calcium channel blockers (spec. diltiazem and verapamil), or digitalis preparations**. These medications should be discontinued for at least 48 hours prior to testing in order to attain maximal stress and only after consulting with the attending physician. An applicant will be expected to demonstrate a minimum functional capacity equivalent to completion of Stage III of the standard Bruce electrocardiographic exercise stress test protocol. **Tabular report, interpretation and actual electrocardiographic tracings should be submitted.**
3. A radionuclide scintigraphy in conjunction with your treadmill stress test. Please include nuclear medicine report and copies of the scintigrams for permanent retention in your file.

Meetings Calendar

Upcoming International Events of Interest

October 27-28, New Orleans, La.
ASTM Symposium on Air Quality and Comfort in Air Cabins. Info: George Luciw, ASTM, 100 Barr Harbor Dr., W. Conshohocken, PA 19428-2959; Phone: (610) 832-9710; E-mail: gluciw@astm.org

Oct. 31 -Nov. 2, Kohala Coast, Hawaii
International Symposium on the Autonomic Nervous System. Info: Anita Zeller, AAS, Mayo Clinic, 811 Guggenheim, 200 First Street SW, Rochester, MN 55905; Phone: (507) 284-3375; FAX: (507) 284-3133; E-mail: zelleranita@mayo.edu

November 1-3, Nashville, Tenn.
Association of Air Medical Services Scientific Meeting. Phone: (703) 836-8732; Web site: <www.aams.org>

November 9-11, Rio de Janeiro, Brazil.
Enhancing Safety in the 21st Century. Sponsored by Flight Safety Foundation, International Federation of Airworthiness, and International Air Transport Assoc. Info: Ahlarn Wahdan Phone: (703) 739-6700; E-mail: jperrin3@compuserve.com; Web site: <www.flightsafety.org>

November 10-13, Seattle, Wash.
Annual Meeting of the American Society for Gravitational and Space Biology. Info: P. Russell, ASGSB, P.O. Box 12247, Rosslyn, WA 22219; E-mail: ASGSB@usra.edu; Web site: <www.asgsb.org>

December 6-8, Atlanta, Ga.
SAFE Association 37th Annual Symposium. Info: Jeanni Benton, SAFE Association, 107 Music City Circle, Ste. 112, Nashville, TN 37214; Phone: (615) 902-0056; FAX: (615) 902-0077.

January 27-30, Newport Beach, Calif.
Annual Medicine Meets Virtual Reality Conference. Info: Aligned Management Associates, Inc., P.O. Box 23220, San Diego, CA 92193; Phone: (860) 447-9767; FAX: (860) 444-0362; E-mail: westwood@uconect.net

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Isolated Troponin I Elevation in Myocardial Infarction

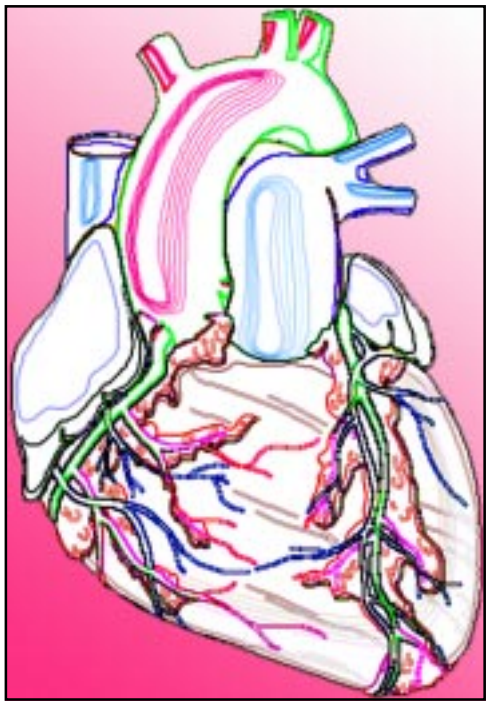
Case Report, by Monty J. Menhusen, DO, MPH

This 47 year-old white male air transport pilot developed severe chest pain while en route to the airport for a scheduled commercial flight. He instead presented to the local emergency room at 0630 hours with intense non-radiating upper epigastric pain, which was associated with dizziness, profuse diaphoresis, and generalized abdominal pain. The airman attributed the pain to be of GI origin, although there was no previous history of reflux esophagitis or peptic ulcer disease.

His cardiac risk factors included a father who had died in his early forties of atherosclerotic disease. The airman had not smoked for the last 9 years.

The airman's EKG showed a mild ST elevation of 0.5 mm in V1, 2, and 3. The creatinine kinase/MB isoenzyme (CKMB) and other cardiac enzymes were normal, but the Troponin I level was elevated to 0.35 (0.00-0.03) ng/ml. Oral antacid medication resulted in initial improvement, but the pain gradually recurred. Nitroglycerin spray resulted in marked amelioration of the symptoms.

A repeat EKG two hours later showed the same subtle but slightly more prominent EKG changes. The repeat CKMB and other cardiac enzymes remained within normal limits, but the Troponin I level remained elevated at 0.19 ng/ml. His blood chemistry profile revealed elevated cholesterol (276 mg/dl), LDL (194 mg/dl), triglycerides (238 mg/dl); and glucose (152 mg/dl). The remainder of the blood chemistry panel was within normal limits. The airman remained asymptomatic but was hospitalized for cardiac observation. The EKG and cardiac enzyme profile remained unchanged at subsequent 2-4 hour test intervals.



Diagnostic cardiac catheterization was performed the following day that demonstrated a mild (50%) stenosis of the mid-segmental left anterior descending coronary artery. The remainder of the coronary artery vessels and left ventricular function were considered normal. A negative exercise stress test showed good exercise tolerance. Exercise myocardial perfusion imaging performed by SPECT Thallium demonstrated no myocardial ischemia or fixed myocardial perfusion defects.

He was discharged from the hospital the following day. The discharge diagnosis included mild coronary atherosclerotic vascular disease, hyperlipidemia, and glucose intolerance. A recommendation was made for an American Heart Association Step II diet and regular physical exercise program. Hospital discharge medications included aspirin, Nitrostat, Atenolol, and Lipitor.

The airman subsequently requested consideration for immediate reinstatement of first-class medical certification. His history of angina pectoris, coronary artery disease, and elevated enteric carbohydrate metabolism made him ineligible for that designation. However, he was determined to be eligible for special issuance of a first-class airman medical certificate under Section 67.401 of the Federal Aviation Regulations (FARs). He was required to have regular first-class physical examinations at the frequency prescribed under the provisions of 14 CFR 61.23. The pertinent aspects of this special issuance authorization was contingent upon, but not necessarily limited to, the following additional requirements:

1. Cardiovascular evaluation and specified laboratory serologies to be performed at 6-month intervals,
2. Exercise stress test to be performed at 6-month intervals,
3. Glycosylated hemoglobin (A1c) determinations at 12-month intervals,
4. SPECT Thallium 201 myocardial perfusion scan at 12-month intervals.

The special issuance process was completed for this airman within 30 calendar days of the onset of symptoms associated with an uncomplicated clinical course.

Pathophysiology

This airman had a fixed coronary obstruction present that may have become symptomatic in the presence of increased oxygen demand. The early initiation of coronary vasodilator therapy may have provided for sufficient secondary collateral circulation to avert additional ischemia and associated myocardial necrosis. However, this airman did not have a

Monty Menhusen, DO, MPH, is an Associate Professor of Anesthesiology at the University of Oklahoma Medical Center, Oklahoma City, Okla. He was on special rotation at the Civil Aeromedical Institute when he wrote this case report.

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Troponin *from page 8*

specific history of angina on physical exertion. A more likely mechanism for the set of events that occurred with this airman would be the correction of a transient decrease in oxygen delivery due to coronary vasoconstriction. Acute impairment in oxygen delivery can also result from coronary artery plaques releasing nonocclusive intracoronary thrombi, causing a concurrent localized release of vasoconstrictor compounds that mediate acute coronary vasoconstriction. This latter mechanism can also result in varied levels of myocardial necrosis and a related elevation of cardiac serologic markers. The very early initiation of coronary vasodilatation therapy received by this airman may have averted more extensive myocardial necrosis and the associated classic clinical laboratory findings of acute myocardial infarction (AMI).

Discussion

Cardiac troponin I (cTnI) is not normally present in the blood of healthy persons and has been shown to be as sensitive a marker for an acute myocardial infarction as CKMB. Neither cTnI nor cTnT offers a significant advantage over myoglobin and CKMB in the early phase (2 hours or less) in the initial screening for AMI. However, studies have shown cardiac troponin I to have greater sensitivity than CKMB to determine AMI at later time intervals. Cardiac troponin I is the most sensitive and specific marker for AMI 6 hours or more after the onset of symptoms. Thus, cTnI is an excellent marker for detecting or excluding AMI because it has better specificity and a wider diagnostic window than the currently accepted standard CKMB test.

Aeromedical considerations for determination of certification after an airman has a myocardial infarction are based on detection of cardiovascular pathological conditions that may result in potential sudden incapacitation. The final determination for each individual certified after a myocardial infarction depends on several factors that change over time. Unfortunately, there are no ideal test methods that are totally effective for use in the assessment of coronary complications of atherosclerotic vascular disease. Reliable noninvasive serum cardiac markers permit early identification of myocardial ischemia and are highly specific for cardiac injury, especially AMI. However, diagnostic tests have false positive and false negative results that may affect any medical decision process. Moreover, diagnostic and treatment patterns also change as technological advancement provides more efficient testing methods for coronary disease.

Another important consideration is the determination of useful prognostic information about the functional impact of coronary artery disease that may be present. Prognostic information can be derived from the serum level of a cardiac marker, provided that there is a close relationship to the degree of actual myocardial damage. Elevation of cTnI within 6 hours of symptom onset predicts an increased risk of complications and/or need for therapeutic interventions. There is also a significant relationship between increasing levels of cTnI and mortality. The mortality rate at 42 days was significantly higher in people with cTnI levels of at least 0.4 ng per milliliter. Each increase of 1 ng per milliliter in the cTnI level has been shown to be associated with additional cardiac mortality risk.

This airman demonstrated EKG and troponin I changes consistent with early myocardial necrosis of the anterior wall of the left ventricle. The CKMB marker was not elevated, but the clinical laboratory values for cTnI were marginally elevated at 0.35 ng per milliliter. The specificity of cTnI for myocardial tissue damage confirms that myocardial necrosis was present. The combination of clinical symptoms, anterior wall EKG changes, and elevated cTnI cardiac marker — would all support the diagnosis of an early acute myocardial infarction.

Conclusion

This airman was granted a special issuance after having a myocardial infarction within a period less than the specified 6 months under FAA regulations. The cardiology panel made their recommendations because of several unique factors in this airman's medical condition and medical course. Troponin I is a very sensitive new test for specific intracellular cardiac protiens and may exceed detection of ischemia by CKMB, which is the currently accepted gold standard. There was only a very mild elevation of this single cardiac marker to a level that has not been shown to have an increased mortality rate. Similarly, there was no evidence of associated functional morphologic or pathophysiologic changes. The subsequent coronary angiogram did not show significant associated atherosclerotic disease that warranted additional treatment. The type of single coronary lesion that was present in this airman has been shown to respond well to conservative therapy and is not associated with risk of changes associated with sudden incapacitation. Thus, the risk of sudden incapacitation was considered to be low for this airman, and he was certified.

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Office of Aviation Medicine *NEWS*

Aviation Medicine Present at EAA Airshow

Joan Morgan

THE EXPERIMENTAL AIRCRAFT Association's (EAA's) annual airshow and fly-in was held in Oshkosh, Wis., from July 27 through August 3. More than 765,000 aviation enthusiasts attended — including a cadre representing the FAA Office of Aviation Medicine (OAM) — who braved the heat, mosquitoes, and noise to support the classic event.

OAM people worked in several areas to provide information to the aviation public:

- The Great Lakes Region Aviation Medical Division (Deputy Regional Flight Surgeon Dr. **Robert E. Liska**, staffers **Dennis Schuring** and **Joan Morgan**, along with the Civil Aeromedical Institute's Dr. **Steven Carpenter**) operated an airman medical information booth during the airshow.
- Headquarters staff (Federal Air Surgeon Dr. **Jon L. Jordan** and Medical Specialty Division Manager Dr. **Robert S. Poole**) gave presentations at the FAA Safety Center and participated in medical discussions with pilots and EAA officials.
- Civil Aeromedical Institute people (Drs. **Steve Veronneau** and Carpenter) presented aeromedical topics at the FAA Forums. Dr. Veronneau opened the Forum bright and early on the first day with a presentation on "Human Performance in Recent Accidents," and Dr. Carpenter closed the Forum Saturday evening with a talk on medical special issuance procedures. For the entire event, education specialists from the Airman Education Program (**Rogers Shaw, Dale Nelson, J.R. Brown**, and **Larry Boshers**), gave pilot spatial disorientation demonstrations using two portable devices, Gyro 1 and Gyro 2. One was located in the FAA Safety Center and the other in the EAA Museum. These demonstrations were so popular that many pilots wishing to experience the "ride" could not be accommodated on some days.

FAA Administrator Jane Garvey and Department of Transportation Secretary Rodney Slater visit with FAA personnel in the FAA Safety Center. L-R: Dr. Liska, Administrator Garvey, Joan Morgan, Dennis Schuring, Dr. Brattain, Secretary Slater, and Dr. Carpenter.

Rogers Shaw made three FAA Forum presentations to a packed house at the FAA Safety Center. He spoke on Human Factors and Spatial Disorientation," "High Altitude Physiology Training," and "Process for Making the Right Pilot Decisions." In recognition of Shaw's efforts, **Mike Beiringer**, Flight Standards Division, presented him with a Certification of Appreciation.

Weekend highlights included a Friday evening meeting with the EAA Aeromedical Advisory Council, which was attended by Drs. Poole, Carpenter, and Veronneau. On Saturday, Drs. Jordan and Poole joined forces with the EAA Aeromedical Council in a forum titled, "Your Ticket to Ride: FAA Medical Certificate." Saturday night's presentation on medical special issuance certification by Dr. Carpenter was well attended. Even after a long day at the airshow, many airmen were pleased that they were able to discuss their concerns with an OAM representative.

On Sunday morning, Dr. Jordan held his traditional 1½-hour forum with airmen in the FAA Safety Center, presenting "Flying Left Seat—Passing Your Next Medical" and responding to questions asked by airmen and others in the audience. (Dr. Jordan made several visits to the Aviation Medicine booth when he was not required to be elsewhere; Regional Flight Surgeon Dr. **Paul L. Brattain**, spent the weekend working at the booth.) Later on Sunday morning, Dr. Jordan was back at the Forum to participate with top FAA officials in a session called "Meet the Administrator."

Joan Morgan is a program analyst in the Great Lakes Regional Medical Division, Des Plaines, Ill.

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OAM NEWS (continued)

FAA International Air Traffic Controller Selection Conference

Michael Heil, PhD

THE CIVIL AEROMEDICAL INSTITUTE'S Human Resources Research Division hosted the First International Air Traffic Controller Selection Conference in Oklahoma City, Okla., June 21-25, 1999. The conference addressed current issues and future challenges in state-of-the art methods of air traffic controller selection. The conference also focused on commonalties and differences across national systems and their future evolvement, and topics for research and development to meet the needs identified for the 21st century.

Moderated panels and breakout groups were organized around the following five themes relevant to air traffic controller selection:

- Job analysis and workforce planning
- Criterion development and psychometrics
- Predictor test development and psychometrics
- Validation, including decision rules, fairness studies, and utility analyses
- Implementation, management, evaluation, and change.

The conference was attended by 42 selection experts from 13 countries worldwide. These experts agreed that efforts should be made to create and establish an "International Working Group of Selection Experts in ATC." Its aim is to foster the exchange of knowledge, expertise, and experience in the marketing, recruitment, and selection of air traffic control specialists and to reach higher effectiveness and efficiency in selection. As part of this effort, an electronic list-serve communication system was created. Additionally, several working committees were formed, including one tasked with organizing the next International Air Traffic Controller Selection Conference scheduled for 2001.

Whinnery New CAMI Division Manager

FAA Photo by Rick Butler

James E. Whinnery, MD, has been selected as the manager of the Aeromedical Research Division at the Civil Aeromedical Institute.

Dr. Whinnery (left) has received a number of awards for his success in medical research and education. A decorated fighter pilot, he is a major general in the Air National Guard.

The selection was not easy, says CAMI Director Dr. **William E. Collins**: "We had excellent candidates for the position, both internal and external, but this was a good opportunity to have someone join the Office of Aviation Medicine with an unusual array of significant aeromedical experiences and accomplishments." Whinnery replaces Dr. **Jerry Hordinsky**, who retired earlier this year for medical reasons.

CAMI Tox Lab Re-certified

The Civil Aeromedical Institute's Toxicology and Biochemistry laboratories received their annual inspection and were commended on their practices by the Toxicology Commissioner. They have now been re-certified for forensic drug testing by the College of American Pathologists.

Picured in the lab at right are (L-R) Dr. **Dennis Canfield**, manager of the Toxicology & Accident Research Lab and Dr. **Arvind Chaturvedi**, team coordinator, Biochemistry Research Team.

Some of the ATC Selection Conference attendees.

Frequently Asked Questions About the New Airman Medical Certification System

How secure is filling out the 8500-8 form over the Internet?

The system supports 128-bit encryption, which is the highest level of encryption available on the US market today. You must use Microsoft's Internet Explorer or Netscape Web browsers to communicate with our servers.

What exactly is encryption and why does it make everything more secure?

Encryption is a way to rewrite something in a code, which can be decoded later with the right key. The encryption we use employs a mathematical process for the key, which is made up of a certain number of bits (hence 128-bit encryption). Thus, the higher the number of encryption bits, the better the encryption algorithm. While you are using the Airman Medical Certification System (AMCS) Internet application, all communication to and from you is encrypted using a maximum of 128 bits. In other words, when you send information to the system, your browser encrypts it using a 128-bit key, then sends it to the server. The system then decodes the information and communicates with the end user via the browser using the key. The key is predetermined when your communication with the Web server is initiated.

Encryption made less cryptic: Why do you need it?

Encryption helps protect your private information so that it cannot be intercepted and read by a third party. Encryption is the scrambling of information for transmission back and forth between two points. A key is required to decode the information. Until recently, no encryption requiring a key greater than 40-bit was permitted to be exported outside of the United States and Canada (40-bit encryption is known as international level, or export-grade encryption). The significantly stronger 128-bit encryption is referred to as US and Canada only level or domestic-grade encryption. If you are currently using a browser with 40-bit encryption (within the US), we'd like you to upgrade now. With the release of 128-bit encryption capability and digital identity verification, you can download a Netscape or Microsoft browser that provides the highest level of encryption commercially available.

40- or 128-bit encryption: How can I differentiate?

Most browser versions let you easily check your level of encryption.

For Netscape browsers: Go to <http://verisign.netscape.com/advisor/index.html> where you will be able to check your browser's encryption level capability.

For Microsoft browsers: To check your level of encryption capability, select "Help" then "About Internet Explorer." You will see a box that contains "Cipher Strength." This will indicate either 40- or 128-bits. When you visit a site that requires encryption, your browser will display a key or a padlock. If you are not in a secure area, the key or padlock will be broken.

When does the new system become effective?

As of October 1, 1999, all US civilian aviation medical examiners are required to submit their FAA Form 8500-8's via the Internet-based Airman Medical Certification System (AMCS). The new system replaces the existing DOS-based version of AMCS.

Final operating instructions were sent to all AMEs prior to the actual October 1 start-up date.

Why is it necessary for me to use a computer to process pilot medical exams?

Because of "Year 2000" (Y2K) compliance issues, we have a new Airman Medical Certification System Internet-based program in place. Aviation medical examiners who are currently using the DOS-based Version 9.5 of AMCS to transmit FAA Form 8500-8 medical examination data to the Federal Aviation Administration should now be using the new system. You will use your computer and modem to access the Internet to electronically submit examination data to the Aeromedical Certification Division (AMCD) in Oklahoma City.

What type of equipment do I need?

The new Internet-based system requirements will accommodate any computer system, regardless of operating system and/or platform, as long as it is capable of supporting:

- An Internet Protocol (IP) dial-up or local area network connection
- An Internet Service Provider (ISP) to provide the IP dial-up or network connection
- Browsers: Microsoft Internet Explorer® V. 4.0, or Netscape Navigator®, V.4.0, capable of 128-bit encryption. This software is free and can be obtained by downloading from the manufacturer's Web site.
  Microsoft: <http://www.microsoft.com>
  Netscape: <http://www.netscape.com>

Alternatively, you can obtain the needed browser software by ordering it on a CD (for a nominal handling and shipping fee) from either manufacturer.

When considering a new computer system or upgrade, we recommend that, for maximum performance, you consider the latest computer industry standards and models. The Internet-based AMCS meets the Year 2000 requirements and will improve performance, reliability, and access. The FAA's Aeromedical Certification Division has a technical support team to help users with the Internet-based AMCS.

Minimum AMCS System Requirements (listed system components will work satisfactorily but may produce considerably slower than desired performance):

- Intel-based or clone (100MHz or faster Pentium system recommended)
- Windows 95, 98, 2000, or NT operating system
- 16 megabytes of RAM (32 megabytes or greater recommended)
- 20 megabytes available hard drive space
- 28K baud modem or better

Can I still make medical certification decisions on my own?

Yes, as in the past, you will make the initial certification decision that will be subject to further review by the Aeromedical Certification Division. The system will not automatically print a certificate, so you will be issuing the certificate attached to the Form 8500-8 just as you did previously.

What are my responsibilities as an AMCS user?

An AME who participates in the Airman Medical Certification System will be responsible for entering and transmitting all FAA Form 8500-8 application data using AMCS Internet v1.0. Once you have entered the data using the AMCS Internet v.1.0, you will then mark the original with "TRANS" (to indicate that it has been electronically transmitted) in the upper right corner and mail to the Aeromedical

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FAQs *(continued)*

Certification Division in Oklahoma City. You also have a responsibility to adhere to Federal Aviation Administration computer use security policies. (You received this information when you received your user name and password.)

How long does it take to enter application data into the computer?

Once the initial learning curve has been passed, we estimate that a reasonably proficient individual can enter an average application in five to seven minutes. Individuals with previous PC and Internet experience will generally find the AMCS Internet v1.0 to be a very easy application to learn. Individuals with no computer and Internet experience will generally require a slightly longer time to become proficient. Please note that the five- to seven-minute estimate is partially offset by the amount of time that was previously spent in typing the back of the form.

What does this new AMCS do for me and my practice?

Some of the benefits of using the new Airman Medical Certification System:

- Assists you in eliminating accidental or missing data on the FAA Form 8500-8.
- Allows you to exercise your best judgment to take proper certification actions.

How can I get hard copies of completed exams?

The new 8500-8 (Series FF) has an original and two copies associated with the form. The original is to be submitted to the AMCD and the remaining copies are for the AME and airman. In cases of falsification by the airman, this procedure will usually obviate the necessity of asking an AME to testify in a National Transportation Safety Board hearing. Also, since the Privacy Act imposes certain responsibilities regarding the maintenance of original records, sending these forms to the AMCD will relieve the AME of those responsibilities and reduce the liability of both the AME and the FAA for possible mishandling of records.

Therefore, the appropriate process for dealing with the Form 8500-8 is as follows:

- The applicant completes the front side of the form and signs it.
- The AME and staff conduct the examination. While it is not mandatory that the results of the examination be entered on the backside of Form 8500-8, you will need to record the data for later use.
- The examination is completed, the certificate is issued (assuming the airman is qualified), and the data are later transmitted to the AMCD — or, as an alternative, the examination data are immediately transmitted to the AMCD, and the certificate is issued.
- The AME copy of the 8500-8 forms is placed in a file.
- The originals are marked "TRANS" (for transmitted) and are mailed to the AMCD.
- Deferrals and Denied medical certificates should be mailed as soon as possible.
- Airman files with no pathology can be sent every two weeks.

How Do I Join the AMCS Network?

- For AMCS questions and instruction for participation, call the AMCS Hotline, (405) 954-3238
- Or write: FAA Civil Aeromedical Institute, Aeromedical Certification Division, AAM-300, P.O. Box 26080, Oklahoma City, OK 73126

What data validation is performed by the AMCS Internet version?

Data validation is performed during data entry. Data validation on the data fields ensures that the information submitted conforms to the proper format (e.g., Date = 10/01/1999, Blood Pressure=120/70). However, data validation does not ensure that the information you provide falls within the acceptable ranges.

How often should I transmit?

We are asking AMEs to transmit as often as possible. Transmitting often will help us process the applications in a more timely fashion. We ask that any deferred or denied certificates be transmitted immediately.

What happens if I get disconnected?

We know that you may get disconnected during the time of transmission, so we have made a system design decision to ensure that data loss will be minimal. The AMCS Internet version will store the information that has been validated. When you log back into the AMCS Internet application, you will find the exam and most of the data that had been previously entered.

Why can't I use the back arrow on my browser?

The AMCS Internet application has display buttons labeled "Forward" and "Previous" located at the bottom of the page for each data entry screen. These are the buttons to use to navigate forward and backward while entering data into the application. There are two reasons for implementing the application in this manner:

- We are validating the data on each page, making the application much easier to use, while improving the response time.
- If you lose your connection while entering data, we will have stored the last page you validated. The browser back arrow will not correctly load entered data and will not correctly submit the application.

What if an airman can't remember the date of his last doctor visit?

We realize the airman may not remember every date of every doctor visit. Because of Y2K compliance, all date fields are required to be set up at MM/DD/YYYY. Try to confirm at least a month and year, then ask the airman to estimate the day. If the airman does not estimate the day, you will need to do it. We recommend just using "01" for the day.

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The Epidemic of Obesity

by Glenn R. Stoutt, Jr., MD, Senior FAA Aviation Medical Examiner

THE EPIDEMIC OF OBESITY is now a crisis. It is one of the major public health problems in the country. About 300,000 deaths yearly are a result of complications of obesity; second only to smoking, which causes about 420,000 deaths yearly.

Medical problems associated with obesity include heart attack, stroke, gout, diabetes, gallbladder disease, arthritis of weight-bearing joints, depression, fatigue, breast and uterine cancer, hypertension, and increased risk of falls and accidents. Add to this decreased self-esteem, less success in the workplace, and even public scorn and ridicule for gross obesity. Pilots may not be able to fit into the cockpit. No FAA regulation about obesity...yet.

Many articles use the Body Mass Index (BMI) to identify obesity. But, you do not need the BMI to find out if you are fat—just take off your clothes and look in a mirror, see how your clothes fit, or see how much fat you can hold between your fingers. The only accurate way to define obesity is to measure actual body fat content by immersing the entire body in a tank of water and then making some mathematical calculations. This is scientifically correct, but certainly not practical. A BMI over 27 indicates that you are overweight; if it is over 30 you are probably obese; a BMI of 25 is about right. Under 18 is abnormal. One problem with the BMI is that muscular people (muscle weighs much more than fat) might have a falsely high BMI. All lean, muscular contestants in a physique contest would have an abnormally high BMI.

The real value of the BMI is to compare population weights over the years. Records of our weights and heights from past decades are readily available from insurance companies and hundreds of other sources. In 1960, 10 percent of our population was considered overweight; that figure has now reached over 32 percent. We are the fattest nation in the world. Forty percent of obesity is genetic (but still responds to diet and exercise). But, we are fat— and getting fatter—not from a sudden appearance of a "fat gene," but because we eat huge portions, eat calorie-laden fast foods, snack constantly, get junk food from vending machines and just about every store we enter. We drive cars instead of walking or biking. We are couch potatoes.

Bookstores are filled with best-selling books on weight reduction. Some are "junk science" moneymakers, others have a gimmick that is blown up to about 300 pages and $25.

The food pyramid diagram (next page) by the U.S. Department of Health and Human Services, may be the most valuable one source of nutritional information ever devised. It contains most of the information you will ever need to know about your diet. It emphasizes food from five food groups. Note that—contrary to what we were taught years ago—complex carbohydrates should make up over 50% of our diet.

This is not junk science. Every major health organization endorses the food pyramid. Our basic diet should be about 15 percent protein, 20-30 percent fat (mostly unsaturated), and 55-60 percent carbohydrates (mostly complex carbohydrates). The popular diet books merely juggle the food percentages instead of just lowering calories by shrinking the pyramid and keeping the proportions the same. Some of the books recommend dangerously high proportions of fat and high protein. Anyone will lose weight on these diets, or on just about any diet if followed long enough. Even if you eat half a stick of butter and two hamburger patties for each meal you will lose weight. But you will have way too much fat in your diet and go into a state of ketosis—also dangerous for your body. No one argues that refined sugar (the topic of a current best seller) is bad for you. No one ever got into poor health by lack of sugar. The bottom line is to use the proportions recommended by the food pyramid and forget all the hype. And exercise, exercise, exercise. Even walking 30 minutes every day will do wonders.

Body Mass Index — Height (ft., in.)

WEIGHT	4′10″	5′0″	5′2″	5′4″	5′6″	5′8″	5′10″	6′0″	6′2″
125	26	24	23	22	20	19	18	17	16
130	27	25	24	22	21	20	19	18	17
135	28	26	25	23	22	21	19	18	17
140	29	27	26	24	23	21	20	19	18
145	30	28	27	25	23	22	21	20	19
150	31	29	27	26	24	23	22	20	19
155	32	30	28	27	25	24	22	21	20
160	34	31	29	28	26	24	23	22	21
165	35	32	30	28	27	25	24	22	21
170	36	33	31	29	28	26	24	23	22
175	37	34	32	30	28	27	25	24	23
180	38	35	33	31	29	27	26	25	23
185	39	36	34	32	30	28	27	26	24
190	40	37	35	33	31	29	27	27	24
195	41	38	36	34	32	30	28	27	25
200	42	39	37	34	32	30	29	28	26
205	43	40	38	35	33	31	29	29	26
210	44	41	38	36	34	32	30	29	27
215	45	42	39	37	35	33	31	30	28
220	46	43	40	38	36	34	32	31	28
225	47	44	41	39	36	34	32	31	29
230	48	45	42	40	37	35	33	31	30

Note: The views and recommendations made in this article are those of the author and not necessarily those of the Federal Aviation Administration.

Here are the food groups, with some choices for World Cup Champion in each category:

△ **Bread, Cereal, Rice, and Pasta** (the mainstay of your diet): Bread (especially whole-grain breads), oats, rice (brown rice is best), macaroni, spaghetti. Try unsweetened whole-grain breakfast cereals and add a little artificial sweetener.

△ **Vegetables**: The winners are Irish potato, sweet potato, broccoli, spinach, carrots, squash, cauliflower, and green peas.

△ **Fruits**: Apples, oranges, grapefruit, bananas, watermelon, apricot, prunes. (Consider vegetables and fruits in the same category nutritionally.)

△ **Milk Yogurt, Cheese**: Best are skim milk, no-fat yogurt, and low- or no-fat cottage cheese.

△ **Meat, Poultry, Fish, Dry beans, Eggs, and Nuts**: Lean meat, about the size of a credit card and about as thick as your finger, once a day; turkey is a good choice. Beans: lima, kidney, Navy, black, pinto, and black-eyed peas. Three or four eggs a week. Most nuts if they are unsalted. Salmon, cod, halibut, and tuna are excellent fish selections.

△ **Fats, Oils, and Sweets**: Bad news. Use sparingly. (Salt, sugar, and fats are the worst things you can eat.) The best oils are olive oil and peanut oil, followed by corn, safflower, soybean, and sunflower. Skip any saturated oils or fats.

Thousands of articles and books have been written about obesity and diets. The truth is that weight control is a simple (?) matter of mathematics. There must be a balance between energy expended (metabolism and exercise) and energy consumed in the diet. Any remaining calories (energy) are stored as fat. The laws of thermodynamics cannot be changed.

Yours for good health and safe flying,

Glenn Stoutt

Dr. Stoutt is a partner in the Springs Pediatrics and Aviation Medicine Clinic, Louisville, Ky., and he has been an active AME since 1960. No longer an active pilot, he once held a commercial pilot's license with instrument, multiengine, and CFI ratings.

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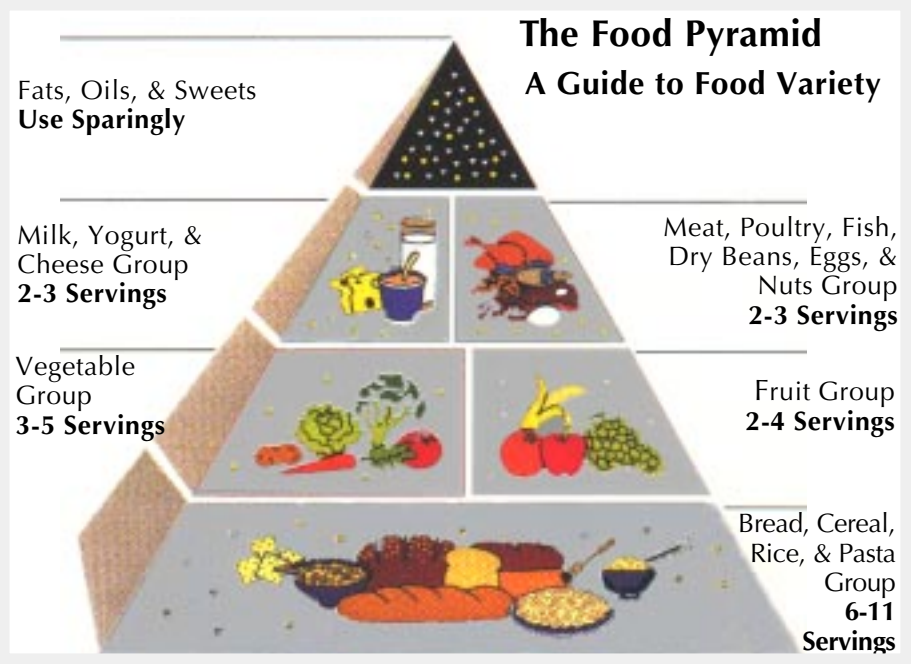

Some Basics of Nutrition and Weight Control

♥ You need 15 calories per pound per day to maintain your weight with normal activity; you will lose weight on 10 calories per pound. Most women will safely lose weight on 1200 calories a day, men on 1500. Consult your physician or a nutritionist to find out which diet best suits your needs. For instance, the amounts of salt or fat may have to be altered if you have high blood pressure or high cholesterol.

♥ Aim to lose fat, not weight. Rapid weight loss is mostly water. In crash diets or prolonged low-calorie diets (500-800 calories per day), fat is lost, but so is muscle and other valuable tissue. Remember that your heart is a muscle. Don't try to lose in one month what you have gained over years.

♥ Your body must burn 3500 calories to lose one pound of fat. The optimum weight loss is about 1 pound a week. Sounds discouraging at first, but this amounts to 12-24 pounds a year of weight that has an excellent chance of staying off.

♥ There is no known food that "melts fat."

♥ Start thinking about an eating plan instead of a diet. There are no loopholes to losing weight. The only way to lose body fat is to create a calorie deficit—either by eating fewer calories or exercising more.

♥ For each year over 30, your body burns 1% fewer calories, probably because of less muscle mass. So, at age 50 you burn 20% fewer calories than you did 20 years before. No wonder we put on the pounds as we get older. Also, as we get older, most of us are less active and need dietary adjustments and a regular exercise program.

♥ Modern Man has exactly the same genetic makeup as Early Man (about 35,000 years ago). Forget the books and articles that say the reason we are fat is because Early Man did not eat cereals and sugar and so on. Early Man did not have Chevrolets, Burger Kings, or TV, and spent about four hours a day roving about—walking to forage for food and running to keep from being eaten. Our obesity problem has become an epidemic only in the past 50 years.

AME TRAINING

Important Info for Aviation Medical Examiners

A Summary of Supplies You Should Have

The FAA Office of Aviation Medicine recently sent the following documentation to all civilian aviation medical examiners located in the US:

√ A package containing 50 copies of the new FAA 8500-8 Form (Series FF) and a letter from the Federal Air Surgeon describing the changes to the new form and providing instructions on disposal of the old forms (Series EE) and usage of the new forms (Series FF) beginning October 1, 1999.

√ A package containing a copy of the new *Guide for Aviation Medical Examiners*.

√ A package containing the Instruction Manual for Aviation Medical Examiners on the Internet-based Airman Medical Certification System (AMCS), a letter from the Federal Air Surgeon describing this new system, and a letter from the Aeromedical Certification Division with your individual AME User Name for the new system.

√ A letter from the Aeromedical Certification Division with your individual AME password for the new system and a form to request additional user names and passwords for your staff.

If you have not received any of these four pieces of correspondence, please immediately contact the AMCS Hotline:

(405) 954-3238

New Training Version Available

The text version of the Medical Standards and Procedures Training for new AMEs and staff members can now be viewed and/or downloaded from the Civil Aeromedical Institute's Web page. To view and print the files, you must have Adobe Acrobat Reader®. If you do not have it, you may download it, free of charge, from:

<http://www.adobe.com/prodindex/acrobat/readstep.html#reader>

The CAMI Web page (home page) address is:

<http://www.cami.jccbi.gov>

Once at the CAMI home page, select **AEROMEDICAL EDUCATION**, then click on **MCSPT (PDF format)** and **MCSPT critique & test (PDF format)** to view or download the files. When you select the course and registration and critique/test, they will be displayed on your screen. Print both the training course and the registration/critique/test forms.

Please follow the instructions provided in the training manual to complete your training. When you have finished the course, please fax or mail your registration information and critique/test form to :

DOT/FAA/CAMI/AAM-400
ATT'N: **Sharon Holcomb**
P.O. Box 25082
Oklahoma City, OK 73125
FAX (405) 954-8016

If you encounter any problems during the download process, please call:

David Nelms
(405) 954-4834

Aviation Medical Examiner Seminar Schedule
October 1999 – September 2000

DATES	CITY	CODES
1999		
October 29 - 31	Charleston, S.C.	N/NP/P (2)
December 6 - 10	Oklahoma City, Okla.	Basic (1)
2000		
January 14 - 16	West Palm Beach, Fla.	AP/HF (2)
March 20 - 24	Oklahoma City, Okla.	Basic (1)
April 28 - 30	Washington, D.C.	Cardio (2)
May 15 - 18	Houston, Texas	N/N/P (3)
June 12-16	Oklahoma City, Okla.	Basic (1)
July 7-9	Chicago, Ill.	AP/HF (2)
August 7-11	Oklahoma City, Okla.	Basic (1)
September 8-10	Reno, Nev.	OOE (2)

CODES

AP/HF	Aviation Physiology/Human Factors Theme Seminar
Cardio	Cardiology Theme Seminar
OOE	Opthalmology-Otolaryngology-Endocrinology Theme
N/NP/P	Neurology/Neuro-Psychology/Psychiatry Theme

(1) A 4½ -day AME seminar focused on preparing physicians to be designated as Aviation Medical Examiners. **Call your Regional Flight Surgeon.**

(2) A 2½ -day AME seminar consisting of approximately 12 hours of AME-specific subjects plus 8 hours of subjects related to a designated theme. **Registration must be made through the Oklahoma City AME Programs Office: (405) 954-4830 or 954-4258.**

(3) A 3½ - day AME seminar held in conjunction with the Aerospace Medical Association (AsMA). **Registration must be made through AsMA. (703) 739-2240.**

The Civil Aeromedical Institute is accredited by the Accreditation Council for Continuing Medical Education and the American Academy of Family Physicians to sponsor continuing medical education for physicians.